

Modeling Background and Issues : Assessment of Impacts of Rocky Reach Dam

Work to Date - Preliminary TMDL

EPA and states of WA, OR, and ID worked extensively on a draft TMDL until late 2003. Numerous public workshops and a posting of a pre-draft on Region 10 website.

Since then, work has been suspended due to disagreements among federal agencies at national headquarters level.

TMDL scope included Columbia mainstem from Canadian border to the ocean, and the Snake mainstem from the Salmon River confluence to the confluence with the Columbia.

EPA has estimated effect of Rocky Reach dam as part of TMDL work

Method of estimating effect of dams

- (1) Simulate existing conditions, minimizing differences between sims & observations
- (2) Alter hydrodynamics in model to simulate un-impounded conditions
- (3) Compare simulated impounded and un-impounded temperatures at dam location

Two tests were run using RBM10 Model

- (1) RR placed into un-impounded river - Preliminary TMDL document
- max increase less than 0.5 deg C (exact estimate not available)
- (2) RR removed from impounded river - unreleased estimates from later work
- max increase of 0.14 deg C

Finding : RR is one of the smaller impacts among Columbia/Snake dams
E.g., Grand Coulee (6 deg C), John Day (1.4 deg C), Wanapum (0.9 deg

C)

TMDL would propose temperature targets at each dam close to the natural condition (estimated using the model), consistent with state WQS. Focus of implementation would be the bigger-impact dams. Feasibility of achieving standards throughout study area is unknown.

Model Framework Selection

RBM10

- 1-Dimensional (cross sectional avg temperature)
- 30 year simulation of daily average temperature - efficient runtimes

CE-QUAL-W2

- 2-Dimensional (laterally averaged temperature, vertical patterns resolved)
- Typically shorter term simulations (1-5 years), longer run times than RBM10
- More complex hydrodynamic representation than RBM10

Model Setup Options - Boundary Temperature Decision

Upstream is not impounded (e.g., site potential definition in TMDL)

Upstream is impounded (includes effects of Grand Coulee)